

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Application No. 10/555,729

Confirmation No. 2003

Applicant: Nie et al.

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Examiner: Leon Yun Bon Lum

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Customer No.: 23460

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. § 1.132 OF SHUMING NIE**

I, Shuming Nie, do hereby declare:

1. I currently am the Wallace H. Coulter Distinguished Chair Professor in Biomedical Engineering at Emory University and the Georgia Institute of Technology, with joint appointments in chemistry, materials science and engineering, and hematology and oncology. I also currently am the Principal Investigator and Director of the Emory-Georgia Tech Nanotechnology Center for Personalized and Predictive Oncology.
2. During the last 10 years, I have published nearly 100 research papers and delivered more than 350 invited talks and keynote lectures in the field of nanotechnology.
3. I am one of the inventors of the subject matter disclosed and claimed in the above-identified patent application ("the present invention"). The present invention relates to

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concentration-gradient quantum dots, series of concentration-gradient quantum dots, and methods of making and using the same.

4. I have reviewed U.S. Patent 6,710,366 (Lee et al.) (hereinafter “the Lee patent”). The Lee patent discloses a quantum dot comprising an “interface region,” wherein “the interface region may be homogenous or inhomogenous [sic] and may comprises chemical characteristics that are graded between the core and the shell materials such that a gradual or continuous transition is made between the core and the shell” (column 7, lines 25-29). However, the Lee patent provides no insight as to how such a quantum dot could be made. For instance, there are no examples directed to a quantum dot comprising a gradual or continuous transition between the core and the shell. In addition, the Lee patent does not set forth any general methods of preparing a quantum dot comprising a gradual or continuous transition between the core and the shell, much less the specific methods that would be required to allow one of ordinary skill in the art to make such a quantum dot. To my knowledge, methods of making a quantum dot comprising an interface region that is graded between the core and the shell materials were not known in the art at the time the Lee patent was filed.

5. In view of the disclosure of the Lee patent and the state of the art at the time the patent was filed, it is my opinion that one of ordinary skill in the art would not be apprised of the methods required to make a quantum dot comprising an interface region that is graded between the core and the shell materials and, therefore, the Lee patent merely provides a hypothetical description of such a quantum dot without knowing if such a quantum dot could, in fact, be made. Specifically, the Lee patent does not disclose the specific methods necessary to produce a quantum dot comprising an interface region that is graded between the core and the shell materials, and such methods were not known in the art at the time the Lee patent was filed. Therefore, to the best of my knowledge, one of ordinary skill in the art would not have been able to produce a quantum dot comprising an interface region that is graded between the core and the shell materials at the time the Lee patent was filed.

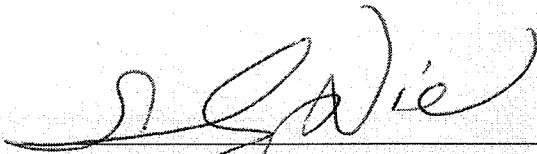
6. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that

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these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under § 1001 of Title 18 of the United States Code, and that such willful, false statements may jeopardize the validity of the application or any patent issued thereon.

Date:

Sept. 23, 2009  
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Shuming Nie, Ph.D.